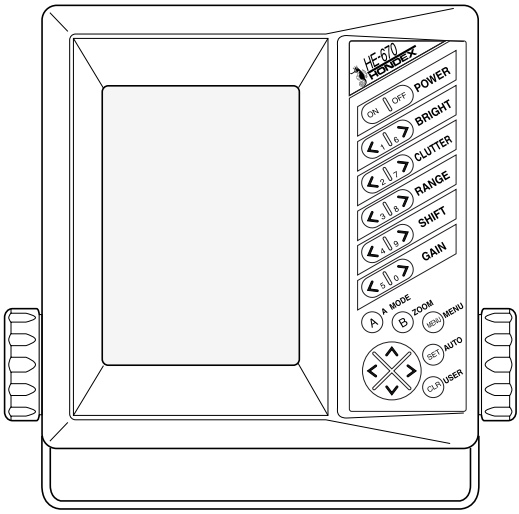
OPERATION MANUAL

(Including Guidelines for Safe Operation)

HE-670

COLOR LCD SOUNDER



⚠Caution To enjoy safe operation, read and fully understand the contents of this Operating Manual before attempting to operate the equipment.

⚠Caution Store this Operating Manual in a safe and convenient place where it can be referred to easily when needed.

HONDA ELECTRONICS CO.,LTD.

INTRODUCTION

We thank you very much for your purchasing our product HE-670.

■ Please be sure to read this operation manual carefully and understand what it describes before you operate this unit in order to keep your safety.

■ After you read this manual, please keep it at the place where you will not lose or break so as to read soon when it is necessary.

■ In case that you resell or transfer this unit, please give it to the new owner.

■ We will not be responsible for product liability (PL) law relating to damage to human or physical property from operation which is not described on this manual or wrong operation.

DEFINITION OF SYMBOL MARK [CAUTION FOR SAFETY]

⚠ **DANGER** : incur the accident resulting in the death or serious wound unless you keep the descriptions.

⚠ **WARNING** : Be in danger of incurring the accident resulting in the death or serious wound unless you keep the descriptions.

⚠ **CAUTION** : Be in danger or incurring the slight wound to human or damage to other physical property unless you keep the descriptions

・ Do not reproduce a part or all of contents described on this manual without our approval.

・ Please understand that the unit may differ from contents described on this manual partially due to change of specifications and so on.

・ If you have questions, errors or omission on this manual, may we trouble you to inform us?

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1. CAUTION ON SAFETY *(PLEASE MAKE SURE TO READ.)*

This section explains the important cautions in order to prevent the person who will use our product or other persons from human damage or damage to their property.

1-1. CAUTION ON SAFETY

⚠ DANGER

High voltage is applied to the inside of unit.
No one besides authorized technician should disassemble or modify it.
Unless you keep it, the accident resulting in the electric shock will occur.
• Please be sure to consult with dealer when you want to repair.

⚠ WARNING

Do not install it simply.
It causes to the accident like human damage.
※Please be sure to install correctly according to descriptions on “Installation of the unit” of this manual.

Do not use the information displayed on the screen of unit for navigation directly.
It causes to the marine disaster.
• Please be sure to use the official marine charts for navigation judgment.

Do not operate the unit when you operate the boat.
It causes to the marine disaster.
• Please be sure to operate it after due confirming the surrounding safety.

Do not put the power on in the presence of flammable materials.
It causes to firing.

Do not use the power supply besides the specified ones.
It causes to heating or firing.

⚠ CAUTION

Do not install at the place where rain or spray dashes directly. (It is not water-proof.)
It causes to electric shock.

Do not install at the place where it becomes hot.
It causes to firing, human damage or electric shock due to increasing temperature inside the unit.

1-2. HANDLING OF CABLES

⚠ WARNING

Be sure to use the specified power supply cable.
It cause to heating or firing.

Do not leave the power plug as it is while it is pulled out of the unit.
If the plug gets wet, it causes to heating or firing due to short circuited.

Be sure to wire in order to prevent the cables from interfering to operate boat.
If feet of crews or operating equipments are caught in cables, it causes to the accident.
• Do not put the heavy objects on cables or do not bend cables excessively.

Do not disassemble or modify the cables.
It causes to heating, firing or electric shock.

Do not use the damaged cables.
It causes to firing or electric shock.

⚠ CAUTION

Do not pull the cable when you pull out the plug.
It causes to firing or electric shock because the cable is broken.
• When you pull out the plug, be sure to have it in your hand and pull it.

1-3. HANDLING OF TRANSDUCER AND WATER TEMPERATURE SENSOR

⚠ WARNING

Work on the board is too unstable and risky.
Installation and maintenance of transducer and water temperature sensor should be done after you land and fix the boat.
Unless you keep it, human damage resulting in death or serious wound will occur.

⚠ CAUTION

Installation of the transducer or water temperature sensor inside the hull with adhesive should be done while you ventilate well inside the boat.
Volatile gas from solvent or etc. causes to toxic symptoms.

When you work using electric tools, please keep your hands dry.
If your hands are wet, it causes to electric shock.

Perfect waterproof treatment should be done when you install the transducer or water temperature sensor through the hull.
If waterproof is not sufficient, it causes to marine disaster because water comes in.

- Do not install on the aluminum boat. (It may cause to corrosion.)

When you pull out or insert the plug of transducer or water temperature sensor, please be sure to turn the power switch off.
It causes to electric shock.

1-4. TFT LCD PANEL

As TFT LCD panel is made with high precision technology, over 99% is effective pixel but less than 0.01% pixel is lacked or there exists pixel light always. It is not trouble. Please understand it in advance.

1-5. CAUTION ON OPERATION

Be sure to put the power switch off when you start to run the engine!

When the engine starts to run, voltage of battery varies heavily. It may influence to the unit. Be sure to put the power switch of the unit off when you start to run the engine.

Power supply should be 11-35VDC!

Please operate the unit at 11-35VDC of power supply voltage.

Be careful for carry!

Do not apply the strong shock like dropping or bumping.

Avoid the place where it is high temperature!

When temperature of the unit exceeds 70℃, it causes to faulty. Please be more careful to operate or store it under direct sun ray in the summer time and use it carefully where it is in the shade as possible. Please avoid to keep it in the trunk of car.

Prohibited to use the organic solution!

Do not clean the unit with organic solution like thinner, alcohol or etc. as some parts of the unit and panel are coated or made by plastic. In case it is too dirty, soak the soft cloth in a synthetic detergent and clean with it after wringing well.

Take memo of important datum!

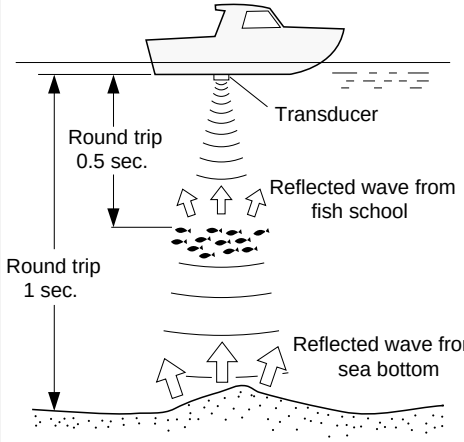
The unit is not designed for storing the datum permanently. Important datum like menu contents should be recorded on the notebook, etc.

THEORY OF ECHO SOUNDER/FISH FINDER

Theory of echo sounder/fish finder is same as echo.

Ultrasonic pulses transmitted from the transducer into the water are reflected from fish school or the sea bottom and then they are received by transducer.

Echo sounder/fish finder converts round-trip time between the time and the ultrasonic wave is transmitted and the time the reflected wave is received into distance and measures the depth It displays size or density of fish school, the outline of bottom or nature of bottom on the screen in different colors.



The speed at which the ultrasonic wave propagates in water is approximately 1,500m per second.
For example, in case of roundtrip time between transmission and reception is 1 sec. to sea bottom and 0.5 sec. to fish school,

Distance to sea bottom

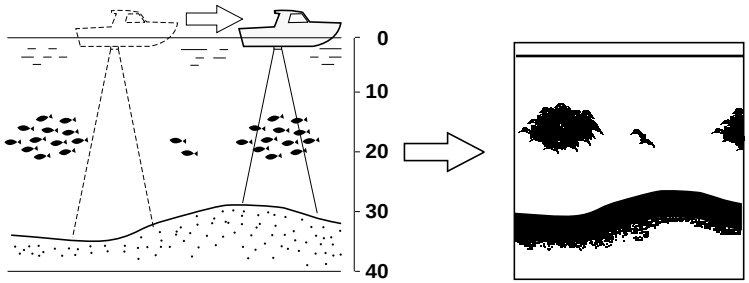
$$\frac{\text{1,500m (1 sec.)}}{\text{2 (round-trip)}} = 750\text{m}$$

Distance to fish school

$$\frac{\text{750m (0.5 sec.)}}{\text{2 (round-trip)}} = 375\text{m}$$

Displayed image

Each time when image is sent by one line to the left, ultrasonic wave is transmitted and it's reflected echo is displayed on the right edge of screen. By repeating this, image is formed.



HOW TO DISTINGUISH THE FISH SCHOOL

Important is comparison between display of fish school and catch

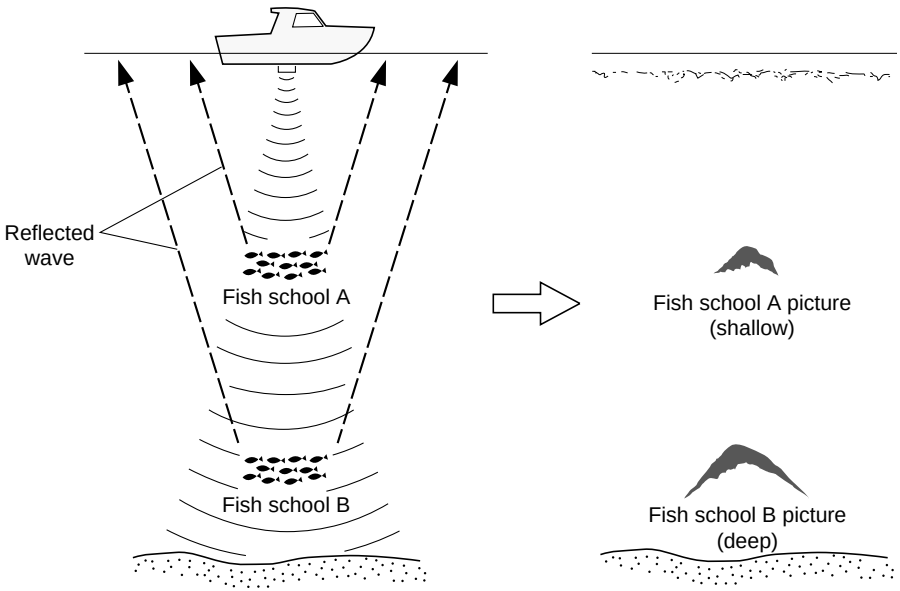
It is possible to distinguish the fish sort by display of fish school to some extent. But even if fish sort is same, it's form making school is different according to difference of fishing ground and difference of time (day and night, four seasons, variation of current).

The important thing to distinguish the fish sort is to know the sort according to their fishing ground or fishing period and to find the useful point on the display by comparing between display of fish school and actual catch.

HOW TO DISTINGUISH THE FISH VOLUME

Fish volume can be distinguished by density and size of fish school

As the harder density the transmitted wave is reflected strongly, you can distinguish the density of fish school according to the strength of reflected echo (that is, different color). Normally we tend to think the larger fish school on the screen the most fish volume. But when fish school are located at the shallow depth and the deep depth, fish school at the deep depth is displayed bigger than at the shallow depth. Because the transmitted wave spreads wider as it goes deeper and the reflected wave spreads wider as it goes shallower. As this result, the deeper becomes the wider the width of fish school becomes on the screen. The important thing to distinguish the fish volume is to judge it according to size of fish school and the strength of reflected echo (color) while you keep "the deeper fish school stays the bigger picture is displayed" in your mind.

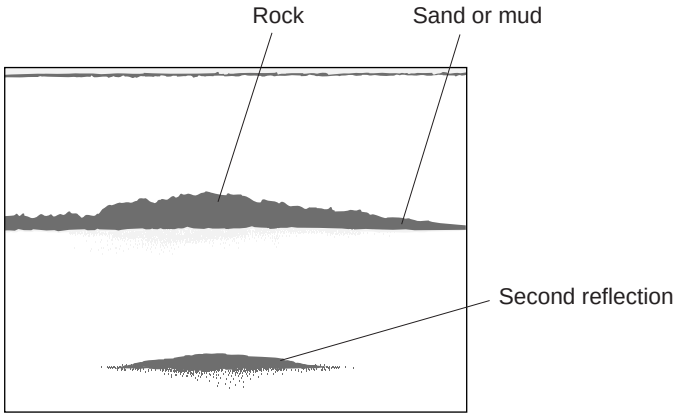


HOW TO DISTINGUISH THE NATURE OF BOTTOM

There are different natures of bottom such as rock, sand, mud or etc.

In case you distinguish the nature of bottom, you judge from the thickness of bottom image and the situation of second reflection. At the hard bottom like rock, reflection of transmitted wave becomes strong and bottom image becomes thick and the second reflection becomes easily to appear. On the other hand, at the soft bottom like sand or mud the reflection becomes weak and bottom image becomes thin and the second reflection becomes hard to appear.

- Second reflection…….Ultrasonic wave transmitted from transducer is reflected from sea bottom and then it is reflected from both sea surface and bottom finally. In short, second reflection is image of two round-trips between sea surface and bottom.



3. FEATURES OF THE UNIT

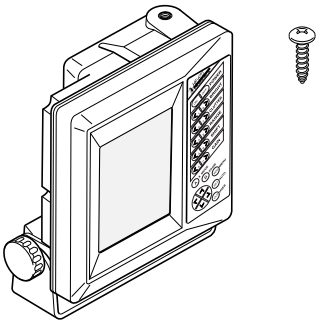
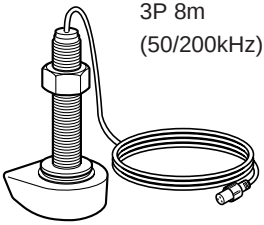
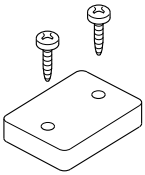
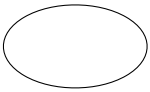
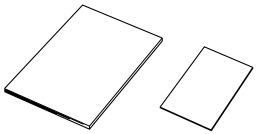
- **It is possible to display dual frequency (50KHz and 200KHz).**
- **Brilliant 6 inch TFT color LCD**
- **Automatic function makes you to adjust sensitivity and depth range automatically.**
- **Aluminum mounting bracket which is strong for shock is supplied as standard.**

4. SPECIFICATIONS

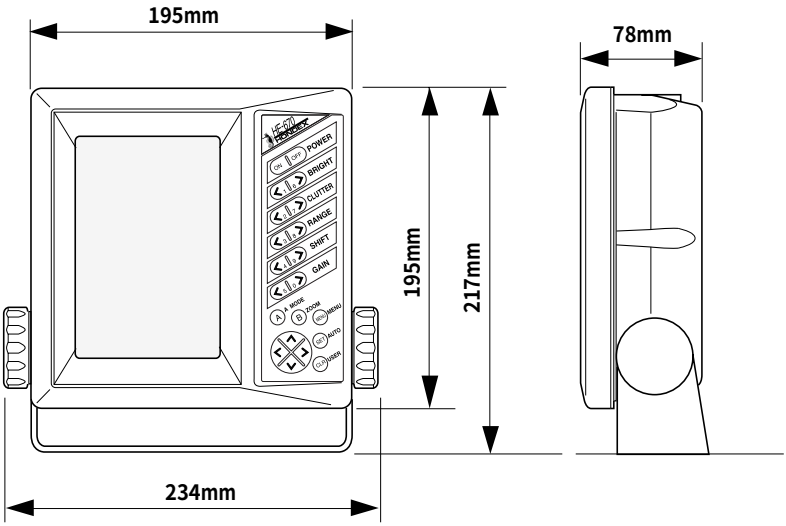
Display	Display	6 inch color LCD
	Number of pixel	320 x 240
	Operating Voltage	11~35V DC
	Power Consumption	15 W
	Dimension (Unit)	217 (H) X 234 (W) X 78 (D) mm
	Weight (Unit)	Approx. 1.5Kg
	Frequency (KHz)	50, 200
	Output Power (W)	300
	Depth Range	3~500m
Function	Auto Range	OFF/ON
	Auto Gain	OFF / L / M / H
	A-mode Readout	OFF/ON
	Fish Alarm	OFF/Small/Large
	Water Temp. Alarm	OFF/Within Range/Out of Range
	Depth Range	OFF/Within Range/Out of Range
	Expansion Mode	Bottom Lock/Auto Exp./Manual Exp.
	Expansion Rate	X2, X4, X8
	Sweep Speed	4 steps plus freeze
	Background Color	5 colors (Black, blue, white, dark blue and green)
	Color Configuration	6 patterns
	Depth Unit	Meter/Feet/Fathoms/Brazas
	Super Range	OFF/ON
	Pulse Length	Short/Medium/Long
	Clean Echo	OFF/Weak/Strong
	Transmitting Output	High/Low
	Depth Readout	OFF/Small/Large
	Simulation Mode	OFF/ON
	Voltage Readout	◯
	Water Temp. Readout	◯
	Water Temp. Sensor	Option
	Back Light	◯

Specifications and appearance are subject to change without prior notice due to improvement.

5. STANDARD COMPOSITION

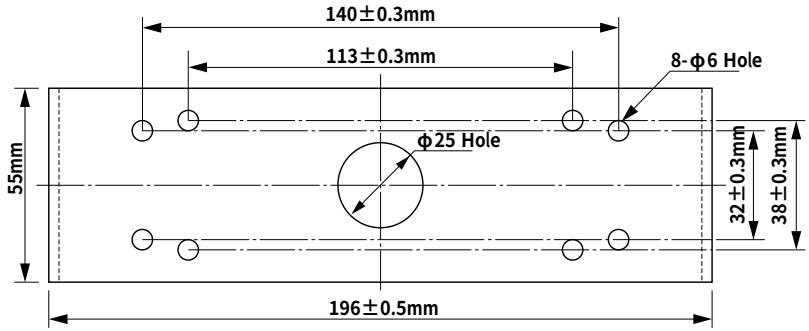
Display Unit (with bracket and clamping knobs) Mushroom-head screw x 4 	Transducer 3P 8m (50/200kHz) 
Cable Cover Pan-head tapping screw 	Power Supple Cable (Fuse 5A)
Disk Plate x 2 	Brand Plate HONDEX
Operations Manual 	

6. DIMENSIONAL DRAWINGS



Unit:mm

(Drawing of holes for installing bracket)



7. INSTALLATION OF THE UNIT

⚠ WARNING

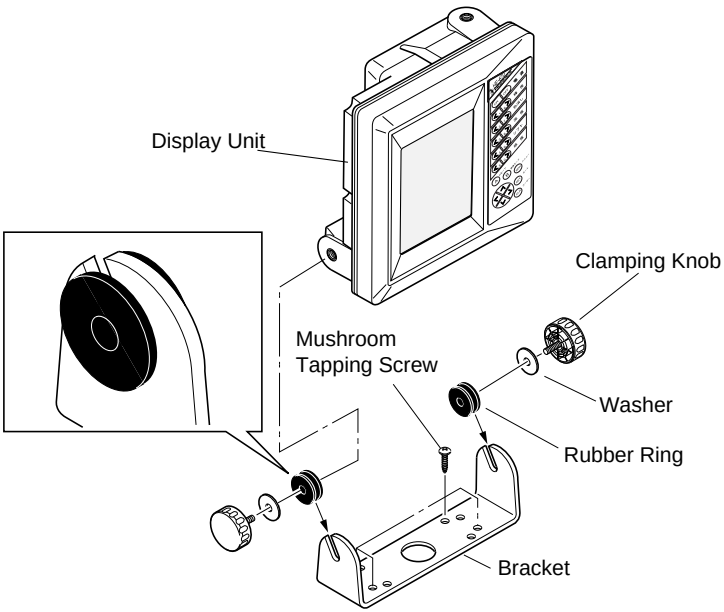
Do not install it simply.
It causes to the accident like wound.
• Please install correctly according to [Installation of the Unit].

[Procedure of installation]

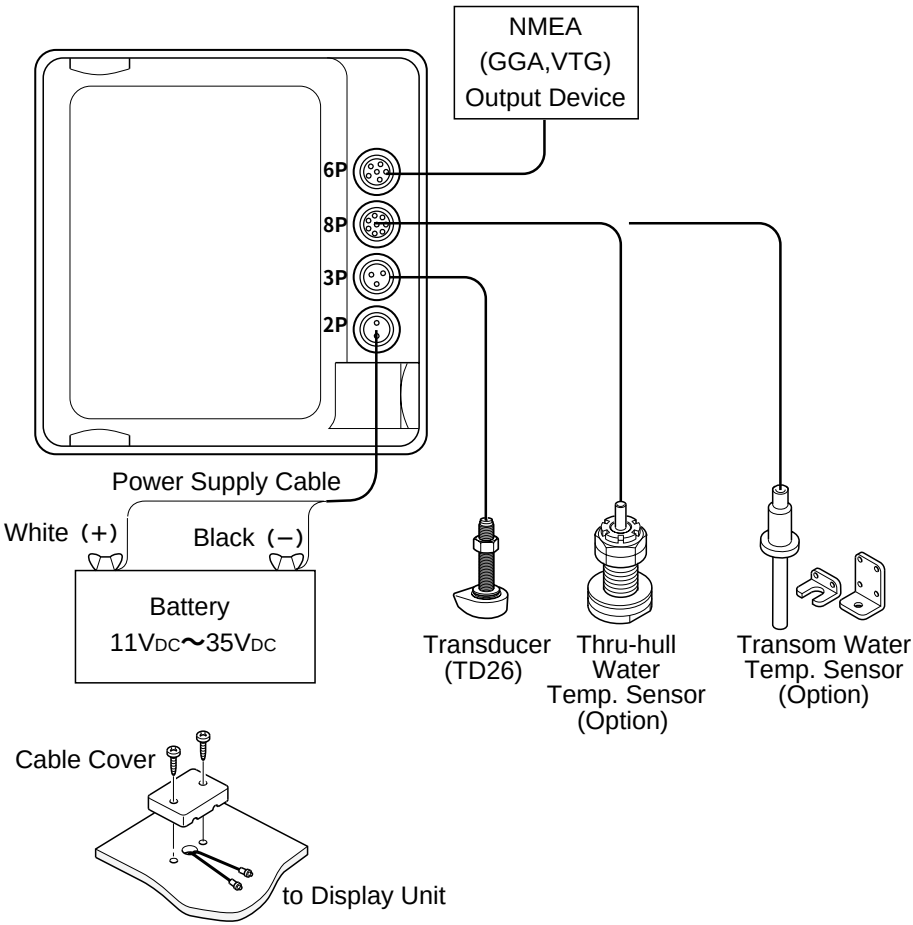
1.<Decision of place you install>
While the bracket is mounted with unit, you decide the place you install and put the mark.
• Keep enough space behind the unit to connect with cables.

2.<Installation of bracket>
Install the bracket with supplied screws into four outside holes.
• Face two open sides of bracket to rear of the unit.

3.<Installation of the unit>
Install the unit referring to the below figure.
• Make sure to put rubber rings and washers at positions on below figure.

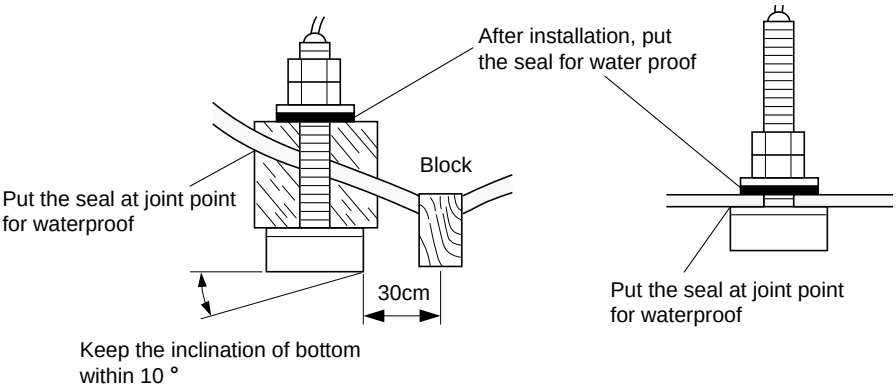


8. CONNECTION WITH THE UNIT



9. INSTALLATION OF TRANSDUCER (THRU-HULL)

Install as near center position of boat as possible.



10. INSTALLATION OF WATER TEMPERATURE SENSOR

• Water temperature sensor is option.

⚠ DANGER

Work on the boat is too unstable and risky.

Installation and maintenance of the water temperature sensor should be done after you land and fix the boat

Unless you keep it, human damage resulting in death or serious wound will occur.

⚠ WARNING

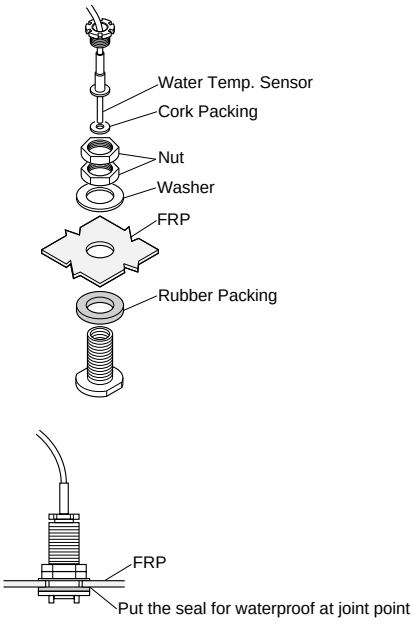
Perfect waterproof treatment should be done when you install the water temperature sensor through the hull.

Unless you keep it, it causes to marine disaster due to inundation.

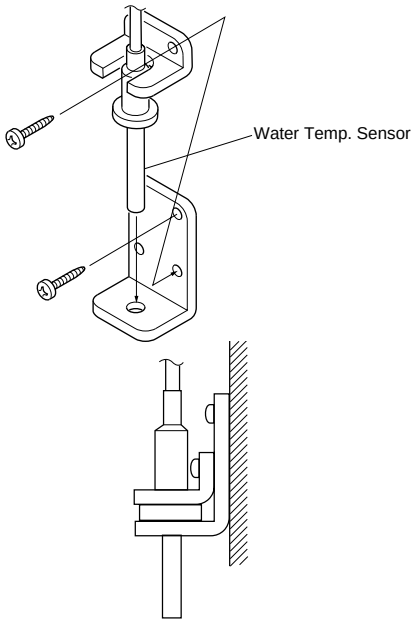
When you work using electric tools, please keep your hands dry.

It causes to electric shock.

Installation of thru-hull
water temp. sensor (TC02C)



Installation of transom
water temp. sensor (TC02ES)

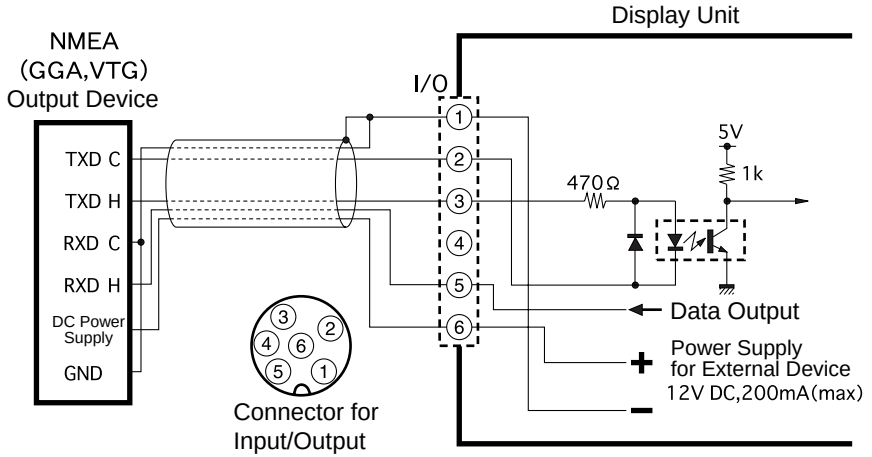


11. CONNECTING DIAGRAM

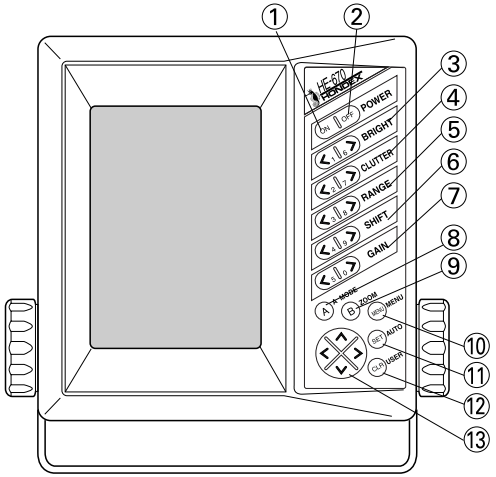
CONNECTOR FOR INPUT/OUTPUT

It is used for connecting NMEA output device.

Data Format	Transmission Rate	Transmission Format
NMEA0183 (GGA、VTG)	4800 bps	Star bit=1, Data bit=8, Parity bit=nil, Stop bit=1



12. DESCRIPTIONS OF CONTROL KEYS



①POWER ON key (→page 19)
Switch the power on.

②POWER OFF key (→page 19)
Switch the power off.

③BRIGHT key (→page 19)
Adjust the brightness of back light.

④CLUTTER key (→page 20)
Adjust the clutter.

⑤RANGE key (→page 21)
Change the depth range.

⑥SHIFT key (→page 22)
Shift the display.

⑦GAIN key (→page 23)
Adjust the sensitivity.

⑧A-MODE key (→page 25)
Each time you press the key,
A-mode switches to ON/OFF.

⑨ZOOM key (→page 26)
Change the display mode.
Each time you press the key,
display changes:
Exp. OFF→B/L→Auto Exp.→Manual Exp.

⑩MENU key (→page 27)
Show the menu mode.

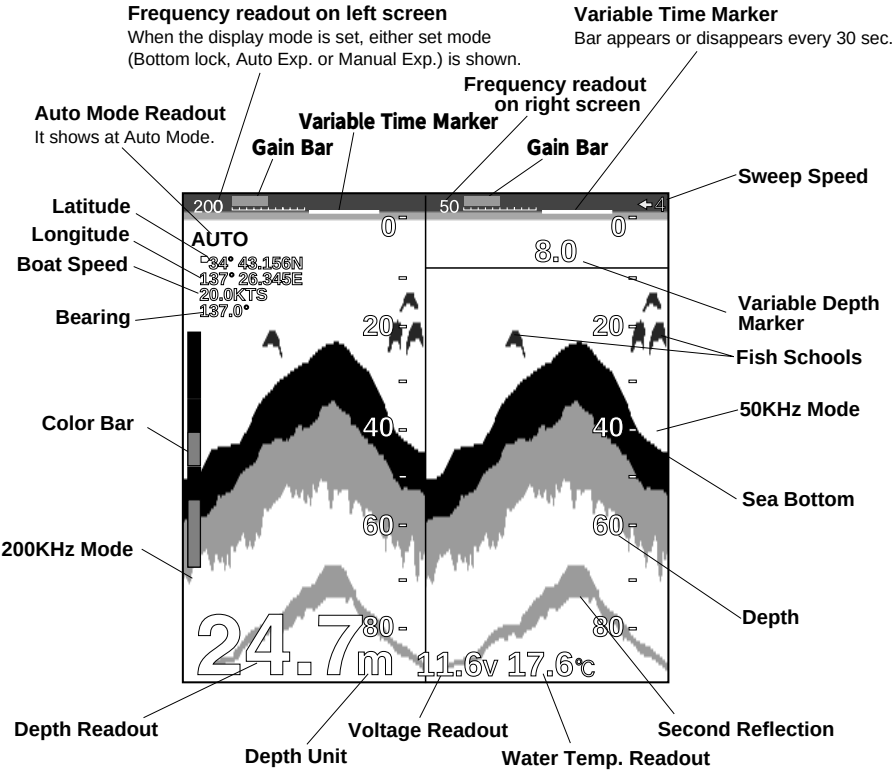
⑪AUTO key (→page 27)
Set the sensitivity and depth range automatically.
Each time you press the key,
Auto mode (Gain, Range) switches to ON/OFF.

⑫USER key (→page 28)
Allocate functions often used by user.

⑬UP/DOWN, RIGHT/LEFT (→page 27)
- Variable depth marker moves by [∧、∨]
- At dual frequency (50/200KHz) mode, switch the display which you want to change the sensitivity by [<、>]
- When menu mode is shown,it is used to select the menu item.

13. HOW TO SEE THE DISPLAY

In case of displaying the dual frequency mode



※Frequency Readout

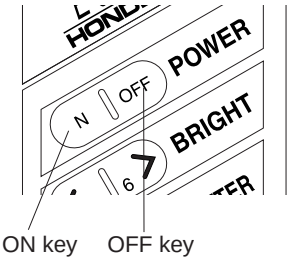
- **Display of one frequency is different from simultaneous dual frequency display.**

※When NMEA (GGA, VTG) output device is connected with the unit, latitude, longitude, boat speed and bearing are shown. (In case setting 2 on Menu 2 is ON.)

14. OPERATION OF THE UNIT

14-1. POWER KEY

ON/OFF OF THE POWER



This switches the power ON/OFF

1 When you press ON key for more than 1 sec., alarm sounds and the power is ON.
Then, if display appears, starting is good.

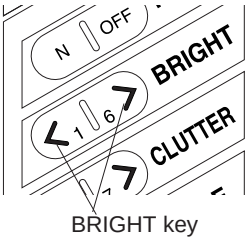
When you press OFF key, alarm sounds and the power is OFF.

※ Until the display appears after the power switches ON, OFF key is not activated.

Note 1) When engine starts, battery voltage varies and it may give bad influence to the unit. Please make sure to start engine after the unit is switched OFF.

14-2. BRIGHT KEY

Adjustment of brightness



This adjusts the brightness of screen.

1 When you press ▷ key, the screen becomes bright.
When you press ◁ key, the screen becomes dark.

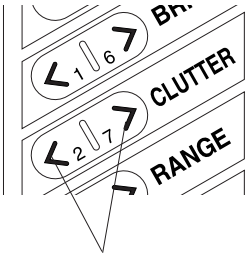
14-3. CLUTTER KEY

Clutter

[Clutter]

Fish school or bottom is displayed while the strength of reflected echo is corresponded with pre-set color configuration.

As this can delete colors in turn from color of weakest echo, it will be enable to distinguish this school easily be deleting the weak echoes like plankton, stain in the water or etc.

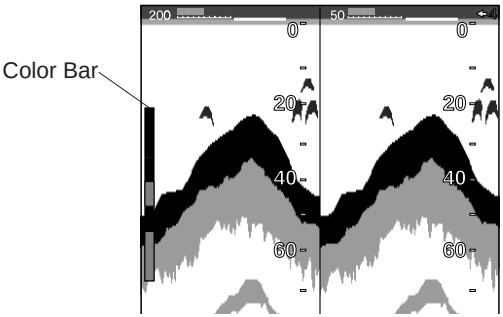


CLUTTER key

When you press CLUTTER key, color is adjusted. Color bar shown on the left side of screen changes.

1 Each time when you press ▷ key, you can erase from the weakest echo's color.

Each time when you press ◁ key, you can return color to initial level from the strongest echo's color.

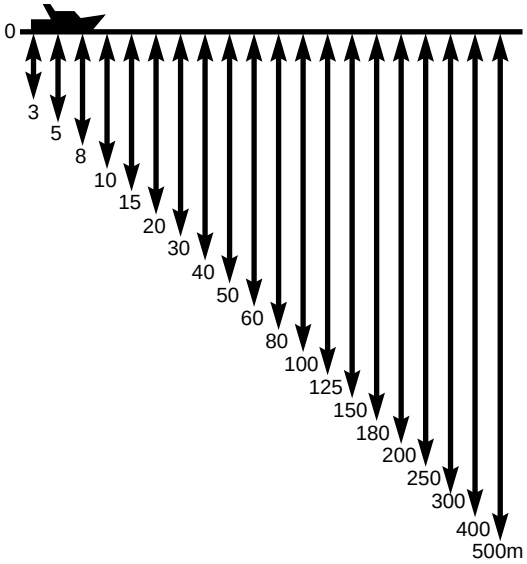


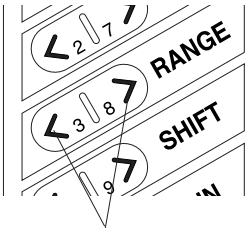
14-4. RANGE KEY

[Depth (Display Range)]

This sets the depth (display range; how deep from the surface of water is displayed?). 19 ranks of display range from 0-5m to 0-500m are available.

Depth (Display Range)





RANGE key

Depth range is changed by pressing RANGE key. Depth readout shown on the screen changes.

1 [To decrease the depth (display range)]
Each time when you press ▷ key, the depth decreases.

[To increase the depth (display range)]
Each time when you press ◁ key, the depth increases.

14-5. SHIFT KEY

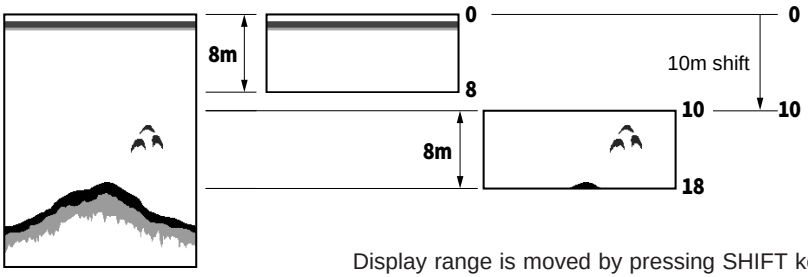
Shift (Shift of display range)

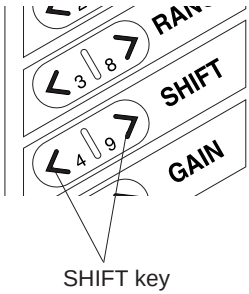
[Shift (Shift of display range)]

You can shift the initial displaying depth downward.

For example, when you shift 10m downward at 0-8m depth range, initial display depth becomes to 10m and display range becomes to 10-18m.

Even if image you want to see is small, it is enlarged by setting the depth (display range) to shallow range when shift is selected.





SHIFT key

Display range is moved by pressing SHIFT key. Depth readout shown on the screen changes.

1 [To shift to shallow depth]

Each time when you press ▷ key, the display range becomes shallow.

[To shift to deep depth]

Each time when you press ◁ key, the display range becomes deep

※ SHIFT key is not activated when AUTO RANGE is selected.

14-6. GAIN KEY

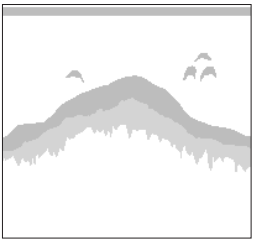
[Gain]

This adjusts the sensitivity to distinguish the bottom or fish school easily.
41 steps of sensitivity from 0 to 40 is displayed in bar or digit. (→ 41 Page)
Optimum sensitivity is that second reflection from bottom is barely displayed.

[Second reflection]

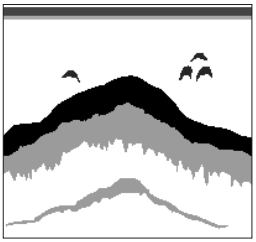
First received echo reflected from bottom is called the first reflection.
It's first reflection reflected from the surface of water goes toward the bottom again.
The next reflection from bottom is called the second reflection.
Normally, it's second reflection is shown on the twice depth of the actual bottom (first reflection).

<Too poor sensitivity>



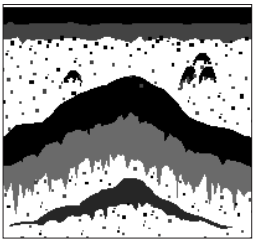
As image is pale, it is difficult to distinct the fish school.

<Good>



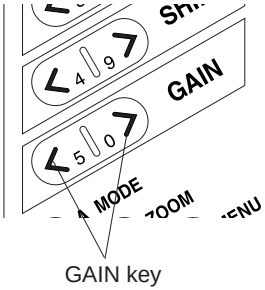
As second reflection is shown, it is easy to distinct the fish school.

<Too much sensitivity>



As plankton, stains in water, and etc. are shown, it is difficult to distinct the fish.

Adjustment of sensitivity



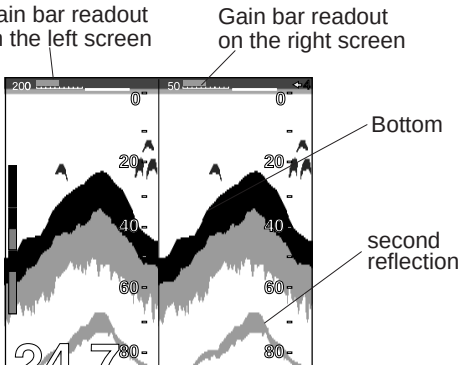
GAIN key

Sensitivity is adjusted be pressing GAIN key.

1

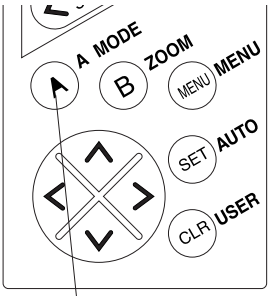
[To increase the sensitivity]
Each time when you press ▷ key, gain bar becomes long and the sensitivity increases.
(In case of digital readout, number increases.)

[To decrease the sensitivity]
Each time when you press ◁ key, gain bar becomes short and the sensitivity decreases.
(In case of digital readout, number decreases.)



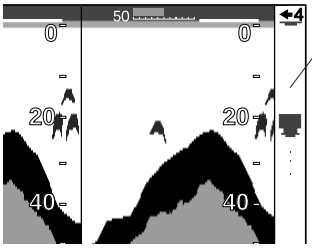
14-7. A-MODE KEY

It is displayed on the right side of screen and it's width changes according to strength of reflected signal.



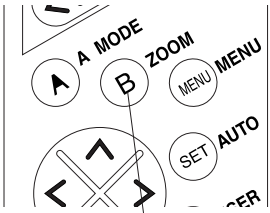
A-MODE

1 When you press (A) key (A-MODE), A-mode switches ON/OFF.

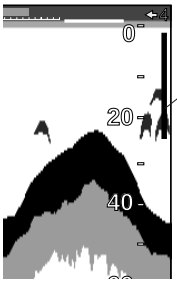


14-8. ZOOM KEY

You can select three image modes (Bottom lock expansion, Automatic expansion or Manual expansion). In case of Auto Exp. and Manual Exp.,
expansion range marker is indicated on the right edge of screen.



ZOOM key



Exp. Range Marker

1 When you press (B) key (ZOOM key), image mode changes.
Current displayed image mode is indicated on the upper left of screen.
In case (Image mode) is OFF,
Normal image is shown.

<Bottom Lock>

Bottom contour is indicated as a straight line and expansion view of certain area from it's contour is shown.

<Auto. Expansion>

The bottom is enlarged and shown. (Expansion range marker can not be moved.)

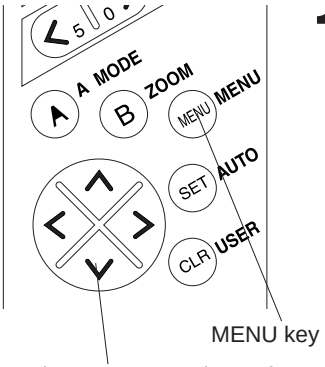
<Manual Expansion>

Certain area is enlarged and shown.
Move the expansion range marker to the area which you want to expand by key and set the expansion range.

14-9. MENU KEY

Menu item is selected using (MENU) key, UP/DOWN, RIGHT/LEFT 〔∧、∨、<、>〕 key, / (SET) key and (CLR) key.

It is used for setting each function of the unit.



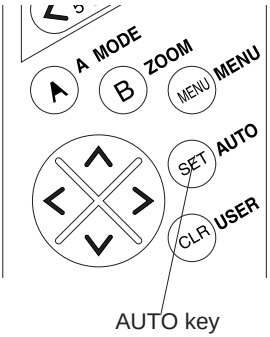
1 Each time when you press (MENU) tkey (MENU), setting mode of MENU 1 and MENU 2 are shown.
Select the item of function by 〔∧、∨〕 key.
Change the setting of item by 〔<、>〕 key.

In order to finish the menu mode, press (MENU) key or (CLR) key.

※Refer to page 31 how to use menu.

14-10. AUTO KEY

When you press AUTO key, pre-set automatic function switches ON/OFF.
Setting of AUTO key is done by selecting on “AUTO KET SET” of menu 2.

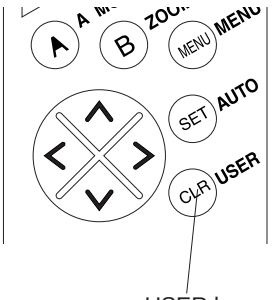


1 When you press (SET) key (AUTO), AUTO is indicated on the upper left of screen.

By pressing (SET) key (AUTO) again, it returns to normal mode.

14-11. USER KEY

You can allocate often used functions at USER key.
Just only USER key makes you quick operation.
You do not need to set on the menu mode.

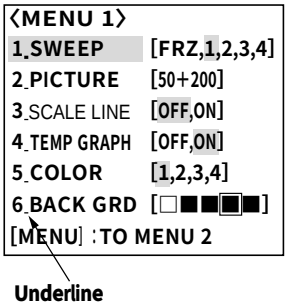


1 Press (CLR) key (USER).
Selected setting item is shown on the screen.

2 Each time when you press (CLR) key (USER), setting changes in turn. You can change the setting by 〔< 、 >〕 key.

Setting menu of USER key disappears about two seconds after you release (CLR) key (USER) or 〔< 、 >〕 key.
You can erase Setting menu by pressing other keys than (CLR) key (USER).

※ "SWEEP SPEED" is set when it is delivered from factory.



※ How to allocate USER key
You can allocate function of which menu item has underline on right of item number to USER key.

1 Select desired function on the menu.

2 Press (CLR) key (USER) for two seconds continuously.

3 At the same time sound like "bi" rises, underline on right of item number which you selected becomes thick.

15. LIST OF MENU AND MEANING OF SETTING

Items of MENU 1	Meaning of setting
1.SWEEP	Set the sounding rate per one sweep. FRZ 1 2 3 4
2.PICTURE	Set the frequency of display on the screen. 50 200 200+50 50+200
3.SCALE LINE	Indicate the line on graduation of depth. OFF ON
4.TEMP GRAPH	Show the water temp. graph. (Water temp. sensor is option.) OFF ON
5.COLOR	Select the color configuration which shows strength of reflected echo. 1 2 3 4
6.BACK GRD	Select the background color of display. Black Blue White Dark blue Green

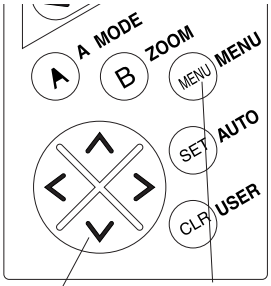
Items of MENU 2			
1.EXP RATE	Set the expansion rate at expansion mode. ×2 ×4 ×8		
2.TEMP ALARM	1.ALARM SET	Alarm goes off within or out of two water temp. OFF IN RANGE OUT RANGE	
	2.TEMP SET 1	Set the temp. set 1. 0～30℃ (15℃ at factory setting)	
	3.TEMP SET 2	Set the temp. set 2. 0～30℃ (20℃ at factory setting)	
3.DEPTH ALARM	1.ALARM SET	Alarm goes off within or out of two depth. OFF IN RANGE OUT RANGE	
	2.DEPTH SET 1	Set the depth set 1. 1～500m (10m at factory setting)	
	3.DEPTH SET 2	Set the depth set 2. 1～500m (100m at factory setting)	
4.FISH ALARM	Alarm goes off when fish is sensed. OFF S L		
5.BATT ALARM	When battery voltage decreases, alarm goes off. OFF 12V (Activate less than 10V) 24V (Activate less than 21V)		
6.OTHERS	1.UNIT SET	1.TEMP UNIT	Select unit of water temp. readout. ℃ ℉
		2.SCALE UNIT	Select unit of depth readout m hr ft Fa br
	2.ADJUST	1.KEEL OFFSET	Set the draft value of boat when you want to indicate the depth from sea surface. 0.0～3.0m (At factory setting 0.0m)
		2.TEMP ADJ	Set the corrected value of water temp. −3.0～+3.0℃ (At factory setting 0.0℃)
		3.VOLT ADJ	Set the corrected value of voltage. −2.0～+2.0V (At factory setting 0.0V)
	3.OTHER SET	1.AUTO R MAX DEP.	Set the depth which sea bottom is searched when auto range is set. 30m 50m 100m 200m 300m 500m
		2.C-ECHO	Display fine image less noise OFF L H
		3.PW REDUCER	Change the transmitting power. LOW HIGH

※ is factory setting.

Items of MENU 2		Meaning of setting
	4.PULSE LENGTH	Select the pulse length. S **M** L
	5.AUTO KEY SET	Set the auto key. Auto key switches ON/OFF as below setting. 1.AUTO G : Adjust sensitivity OFF L M **H** 2.AUTO R : Adjust depth OFF RNG SFT
4.READOUT 1	1.DEPTH DIG	Select the size of depth digit. OFF S **L**
	2.GAIN	Select the style of gain readout. **BAR** DIGIT
	3.SUPER RANGE	When the depth range changes, rewrite whole image to after change. OFF **ON**
	4.DEPTH MARKER	Select color of variable depth marker. OFF WHITE RED GREEN BLUE YELLOW LIGHT BLUE MAGENTA
	5.COLOR BAR	Switch color bar readout ON/OFF OFF **ON**
5.READOUT 2	1.LAT/LON	※When NMEA output device is connected with the unit, it is effective. Switch readout of latitude/longitude ON/OFF. OFF **ON**
	2.BOAT SPEED	Switch readout of boat speed ON/OFF. OFF **ON**
	3.BEARING	Switch readout of bearing ON/OFF. OFF **ON**
6.SYSTEM MENU	1.SIMULATION	Switch simulation mode ON/OFF. OFF **ON**
	2.DISPLAY	Select the display mode. **LANDSCAPE** P REV L REV PORTRAIT
	3.SYSTEM RESET	Reset the set items and return to factory setting.

※ **bold** is factory setting.

HOW TO SELECT MENU



Change item by [∧、∨] key

Change item by [<、>] key

〈MENU 1〉
1_SWEEP [FRZ,1,2,3,4]
2_PICTURE [50+200]
3_SCALE LINE [OFF,ON]
4_TEMP GRAPH [OFF,ON]
5_COLOR [1,2,3,4]
6_BACK GRD [□■■■■]
[MENU] :TO MENU 2

To MENU 2 by (MENU) key

Selection mode by > key or (SET) key

〈MENU 2〉
1_EXP RATE [x2,x4,x8,]
2 TEMP ALARM ▶
3 DEPTH ALARM ▶
4_FISH ALARM [OFF, S, L]
5_BATT ALARM [OFF,12V,24V]
6 OTHERS ▶
[MENU] : TO FINISH MENU

1 How to show menu mode?

Selection mode of MENU 1 is shown by pressing (MENU) key.

2 How to change content of menu?

Selected items are shown.

〔∧、∨、<、>〕key makes you select or change content.

- Cursor (selected item) moves upward by pressing ∧ key.
- Cursor (selected item) moves downward by pressing ∨ key.
- Selected value increases or cursor moves right by pressing > key.
- Selected value decreases or cursor moves left by pressing < key.

3 How to move to next menu page?

- At MENU 1, MENU 2 is shown by pressing (MENU) key.
- At MENU 2, it changes to normal display mode by pressing (MENU) key.
- For items with ▶ on the right, selection menu is shown by > key or (SET) key.
- It returns to previous menu by (MENU) key.

4 How to cancel MENU mode?

Menu mode is canceled and it returns to normal display mode even in any menu mod when you press (CLR) key.

※ Operation sometimes differs depending on menu items.
※ Established contents on menu are stored even if power is switched OFF.

17. SETTING THE FUNCTION BY MENU

17-1. MENU 1

SWEEPING SPEED

[Sweeping Speed]

On echo sounder/fish finder, the newest display (display just under the boat) is shown on the right edge of screen. At the same time previous display moves leftward. Display of echo sounder/fish finder is formed by repeating such movement. Sweep speed is speed that display forwards. Display expands or reduces horizontally by changing the sweeping speed.

[Relation of sounding rates and sweeping speed]

5 sweeping speed can be selected on the menu. Ratio of sweeping speed vs. sounding rates at each speed is shown on the below table.

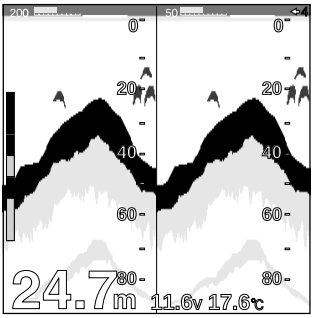
Sweeping Speed / Sounding Rates	
4 (1／1)	↑ Fast
3 (1／2)	
2 (1／3)	
1 (1／4)	↓ Slow
FREEZE	

1 [1. SWEEP] is selected on MENU 1.

2 Set the sweeping speed.
(5 steps: 1, 2, 3, 4, FREEZE)

DISPLAYED IMAGE

Frequency (Single frequency display, dual frequency simultaneous display) which you will show on the screen is selected.



in case of <200+50>

1 [2. PICTURE] is selected on MENU 1.

2 Displayed image is set.

50 : 50KHz image is displayed on whole screen.

200 : 200KHz image is displayed on whole screen.

50+200 : 50KHz image is displayed on the left half of screen and 200KHz image is displayed on the right half of screen.

200+50 : 200KHz image is displayed on the left half of screen and 50KHz image is displayed on the right half of screen.

SCALE LINE

Horizontal lines are shown at the position of depth scale on the screen.

1 [3. SCALE LINE] is selected on MENU 1.

2 Set the scale line.
ON : Scale line is shown.
OFF: Scale line is not shown.

WATER TEMPERATURE GRAPH

Water temperature graph is shown on the screen. It enables you to know the variation of water temperature and recognize the turning of tide. It helps you to select the fishing point.

1 [4. TEMP GRAPH] is selected on MENU 1.

2 Set the Temp. graph.
ON: Temp. graph is shown.
OFF: Temp. graph is not shown.

COLOR CONFIGURATION

Reflected signal of sound wave is converted into 17 ranks of digital signal according to the strength of response.
As image of echo sounder/fish finder is displayed in color by this color configuration, you can know the strength of response by displayed color. As display of response varies by changing color configuration, it enables to display defined color specially.

1 [5. COLOR] is selected on MENU 1.

2 Color configuration is set. (6 steps: 1~6)

BACKGROUND COLOR

Reflected echo is indicated in different color according to it's strength. Visual image of display differs from surrounding brightness. It becomes easy to see the display by setting the background color of five colors.

1 [6. BACK GRD] is selected on MENU 1.

2 Background color is selected.
(Black, Blue, White, Dark Blue, Green)

17-2. MENU 2

EXPANSION RATE

Expansion rate of enlarged image can be selected to X2, X4 or X8.

1 [1. EXP RATE] is selected on MENU 2.

2 Expansion rate is selected.
Select from X2 (two times), X4 (four times) and X8 (eight times).

WATER TEMPERATURE ALARM

[Water Temperature Alarm]
Alarm goes off within or out of two water temperatures.
(TEMP SET 1, TEMP SET 2).

1 [2. TEMP ALARM] is selected on MENU 2.

2 Alarm setting is established.
IN RANGE: Alarm goes off when it is within two water temperatures and water temp. readout flashes.
OUT RANGE: Alarm goes off when it is out of two water temperatures and water temp. readout flashes.
OFF: Water temp. alarm is canceled.

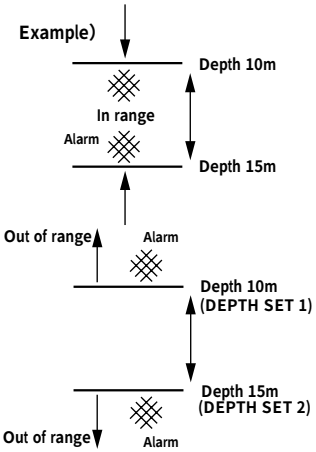
3 TEMP SET 1 and TEMP SET 2 is set respectively.

※ If you press (CLR) key when alarm sounds, alarm stops to sound. However, water temp. readout does not stop to flash. When it is out of alarm range once and it returns in alarm range, alarm sounds.

DEPTH ALARM

[Depth Alarm]

Alarm goes off within or out of two depths (DEPTH SET 1, DEPTH SET 2).



1 [3. DEPTH ALARM] is selected on MENU 2.

2 Alarm setting is established.

IN RANGE : Alarm goes off when it is within two depths and depth readout flashes.

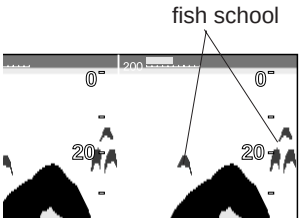
OUT RANGE: Alarm goes off when it is out of two depths and depth readout flashes.

OFF : Depth alarm is canceled.

※ **If you press (CLR) *key when alarm sounds, alarm stops to sound. However, depth readout does not stop to flash. When it is out of alarm range once and it returns in alarm range, alarm sounds.***

FISH ALARM

When the response to be supposed fish school is displayed, alarm goes off.



1 [4. FISH ALARM] is selected on MENU 2.

2 S : Sensitivity increases to catch the response from small fish school.

L : To catch the response from large fish school only.

OFF: Fish alarm is canceled.

Note 1) It may catch the response from other objects than fish depending on conditions.

Note 2) At dual frequency image, fish alarm activates on the right display only.

BATTERY ALARM

When voltage of battery decreases, alarm goes off.

1 [5. BATT ALARM] is selected on MENU 2.

2 12V: When voltage of battery becomes less than 10V, alarm goes off and voltage readout flashes.
24V: When voltage of battery becomes less than 21V, alarm goes off and voltage readout flashes.
OFF: Battery alarm is canceled.

※ If you press (CLR) key when alarm sounds, alarm stops to sound. However, battery readout does not stop to flash. When it is out of alarm range once and it returns in alarm range, alarm sounds.

SETTING OF UNIT: WATER TEMPERATURE UNIT

Either "℃" or "℉" is selected.

1 [6. OTHERS]→[1.UNIT SET]→[1. TEMP UNIT] is selected on MENU 2.

2 Select UNIT (℃・℉)

SETTING OF UNIT: DEPTH UNIT

Either m, hr, ft, Fa or br is selected.

1 [6. OTHERS]→[1.UNIT SET]→[1. SCALE UNIT] is selected on MENU 2.

2 Select UNIT (m, hr, ft, Fa or br).

CORRECTION: KEEL OFFSET

It enables to set the draft value of boat when you want to indicate the depth from sea surface. You can set draft value at 0.1m step from range of 0~+2.0m.

1 [6. OTHERS]→ [2.ADJUST]→ [1. KEEL OFFSET] is selected on MENU 2.

2 Change the draft value by RIGHT/LEFT 〔< 、 >〕 key.

CORRECTION: WATER TEMPERATURE CORRECTION

You can correct the water temperature at 0.1 ° step from range of –3.0 ° ~ +3.0 ° after connecting optional water temperature sensor. Please set the corrected value so that water temperature digit shown on the bottom of screen is equal to real temperature.

1 [6. OTHERS]→[2.ADJUST]→[2. TEMP ADJ] is selected on MENU 2.

2 Change the corrected value by RIGHT/LEFT 〔< 、 >〕 key.

CORRECTION: VOLTAGE CORRECTION

You can correct the voltage at 0.1 V step from range of –2.0V~+2.0V.
Please set the corrected value so that battery voltage digit shown on the bottom of screen is equal to real battery voltage.

1 [6. OTHERS]→[2.ADJUST]→[3. VOLT ADJ] is selected on MENU 2.

2 Change the corrected value by RIGHT/LEFT 〔< 、 >〕 key.

OTHER SETTING: AUTO RANGE MAX. DEPTH

Set the depth which sea bottom is searched when auto range is set.
When auto range maximum depth is set to deep, it takes long time to indicate the depth digit and depth range sometimes becomes deep range due to malfunction. In this case, please set auto range Max. depth to meet with the depth of sea where you operate.

1 [6. OTHERS]→[3.OTHER SET]→[1.AUTO R MAX DEP.] is selected on MENU 2.

2 Select the AUTO RANGE MAX. DEPTH (30m, 50m, 100m, 200m, 300m, 500m) by RIGHT/LEFT 〔<、>〕 key.

※ When AUTO RANGE MAX. DEPTH is set, depth meter and Auto Range do not activate at the depth more than such auto range max. depth.

OTHER SETTING: CLEAN ECHO

Non-synchronized noise like interference with other boat's fish finder, air bubbles, electric noise, mechanical noise, etc. is eliminated and clear display less noise is shown.

1 [6. OTHERS]→[3.OTHER SET]→[2.C-ECHO] is selected on MENU 2.

2 OFF : Clean Echo function is canceled.
L : Set Clean Echo to low.
H : Set Clean Echo to high.

※ When there is less noise, minute response can be displayed by selecting OFF of C-ECHO.

OTHER SETTING: TRANSMITTING OUTPUT

Two steps of transmitting output (high, low) can be selected.

1 [6. OTHERS]→ [3.OTHER SET]→ [3.PW REDUCER] is selected on MENU 2.

2 LOW : It does not detect to deep but power consumption is less.
HIGH : It detects to deep but power consumption is much.

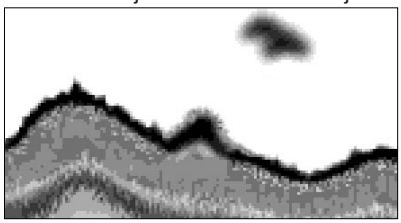
OTHER SETTING: PULSE LENGTH

It selects pulse length. Theory of fish finder is same as echo in water. Length of transmitted ultrasonic wave is called pulse length. Selection of pulse length (long, medium or short) enables you to change vertical resolution.

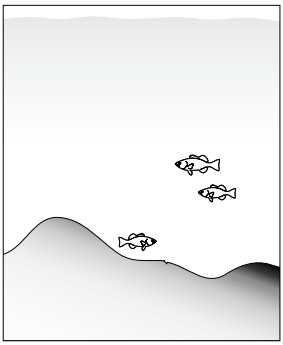
1 [6. OTHERS]➞[3.OTHER SET]➞[4.PULSE LENGTH] is selected on MENU 2.

2
S : It can not detect to deep but nice resolution and low power consumption.
M : It can detect to deep but resolution becomes a little bit bad.
L : It can detect to deeper but resolution becomes worse.

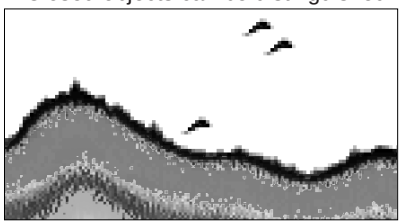
[Long pulse length]
Closed objects look like one object.



For example, this case.



[Short pulse length]
Closed objects can be distinguished.



OTHER SETTING: SETTING OF AUTO KEYS

Condition of ON/OFF is set when AUTO key is pressed.

Example 1) In case AUTO G (HIGH) and AUTO R (RNG) are set, AUTO G (HIGH) and AUTO R (RNG) are set at the same time when AUTO key is pressed. By pressing AUTO key again, both AUTO G and AUTO R turn to OFF.

Example 2) In case AUTO G (HIGH) and AUTO R (OFF) are set, only AUTO G (HIGH) is set when AUTO key is pressed. By pressing AUTO key again, AUTO G turns to OFF.

1. AUTO GAIN

Sensitivity is automatically adjusted so that response from sea bottom is even.
It selects the level of sensitivity.

1 [6. OTHERS]→[3.OTHER SET]→[5.AUTO KEY SET]→[1.AUTO G] is selected on MENU 2.

2 Set mode of Auto Gain.
- LOW : Set the adjustment of sensitivity to low level.
- HIGH : Set the adjustment of sensitivity to high level.

2. AUTO RANGE

Depth range is automatically changed so that sea bottom is always shown on the optimum position of screen (lower half area). It selects to what extent of response is shown.

1 [6. OTHERS]→[3.OTHER SET]→[5.AUTO KEY SET]→[1.AUTO R] is selected on MENU 2.

2 RNG : Change the depth range automatically.
- SFT : Move the displayed depth range automatically.
- OFF : Auto Range function is canceled.

READOUT SETTING1: DEPTH READOUT

It can change size of depth digit.

1 [6. OTHERS]➜[4.READOUT 1]➜[1.DEPTH DIG] is selected on MENU 2.

2 OFF : Depth digit is not shown.
S : Depth digit is shown in small number.
L : Depth digit is sown in large number.

READOUT SETTING1: GAIN READOUT

1 [6. OTHERS]➜[4.READOUT 1]➜[2.GAIN] is selected on MENU 2.

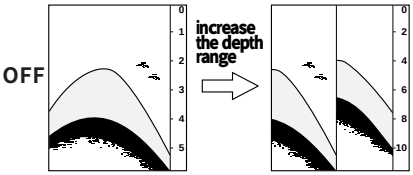
2 BAR : Sensitivity is indicated in bar.
DIGIT : Sensitivity is indicated in digit.

READOUT SETTING1: SUPER RANGE

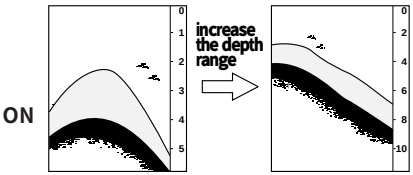
When depth range (displayed depth range) changes, it rewrites whole previous image recorded on the screen to after change.

1 [6. OTHERS]➜[4.READOUT 1]➜[3.SUPER RANGE] is selected on MENU 2.

2 ON : Rewrite previous image.
OFF : Super Range function is canceled. (It does not rewrite previous image.)



Does not rewrite previous image



Rewrite previous image

Note 1) When shallow range is to changed to deep range at Super Range ON, previous image which is not displayed is not shown.

READOUT SETTING1: DEPTH MARKER

1 [6. OTHERS]➜[4.READOUT 1]➜[4.DEPTH MARKER] is selected on MENU 2.

2 White~Magenta: Depth marker is shown at selected color.
OFF : Depth marker is not shown.

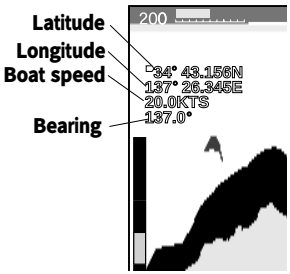
READOUT SETTING1: COLOR BAR

1 [6. OTHERS]➜[4.READOUT 1]➜[5.COLOR BAR] is selected on MENU 2.

2 ON : Color bar is shown.
OFF : Color bar is not shown.

READOUT SETTING 2

Readout of latitude/longitude, boat speed and bearing are set.



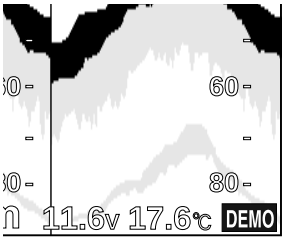
1 [6. OTHERS]➜[5.READOUT 2] is selected on MENU 2.

2 1 Latitude/Longitude
OFF : Latitude/Longitude are not shown.
ON : Latitude/Longitude are shown.
2 Boat Speed Readout
OFF : Boat speed is not shown.
ON : Boat speed is shown.
3 Bearing Readout
OFF : Bearing is not shown.
ON : Bearing is shown.

※ They are effective when NMEA (CGA, VTG) output device is connected with the unit.

SIMULATION MODE

This select whether simulation mode is or is not shown.



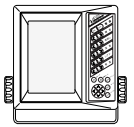
1 [6. OTHERS]→ [6.SYSTEM MENU] → [1. SIMULATION]is selected on MENU 2.

2 OFF : Simulation mode is canceled.
ON : Simulation mode is shown.

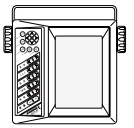
※ In case of simulation mode, DEMO is shown on the lower right of screen.

CHANGE OF SCREEN MODE

You can change the display (landscape, portrait, landscape reverse and portrait reverse) according to the status of installing the unit.


Portrait

Landscape


Portrait Reverse

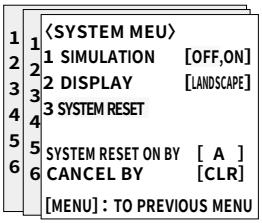
Landscape Reverse

1 [6. OTHERS]→ [6.SYSTEM MENU] → [2. DISPLAY]is selected on MENU 2.

2 Select LANDSCAPE, P REV, L REV or PORTRAIT.

SYSTEM RESET

When you want to return to factory setting, execute system reset.



1 [6. OTHERS]→ [6.SYSTEM MENU] → [3. SYSTEM RESET]is selected on MENU 2.

2 Press (SET) key (AUTO key).

3 SYSTEM RESET ON BY [A]
(A) key: Returns to factory setting.

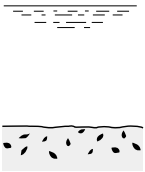
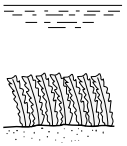
CANCEL BY [CLR]
(CLR) key: It is canceled and returns to System Reset mode.

※ Switch the power off by pressing OFF key. Then turn the power on again.

18. CAUTION ON SAFETY (PLEASE MAKE SURE TO READ)

When the condition of this unit is bad, please check the following points before asking to repair.

Symptoms	Causes	Remedy
Power can not be turned on.	Voltage of battery is lower tan standard value (11V).	Recharge the battery.
	Contact of power connector is poor.	Tighten firmly. Clean and remove the rust, dust, etc. In case of corrosion, please replace. • Replace the power supply cable. • Replace the connector.
	Incorrect connection of power cable to boat battery	Check the polarity and connect correctly.
	Wire insider power cable is cut.	Replace the power cable.
	Blown fuse.	Replace fuse (5A)
No display on the screen.	Brightness control is set to minimum.	Adjust the brightness control. (Refer to page 19)
Bottom or fish can not be displayed at all.	Contact of transducer connector is bad. Connect surely. Clean the surface of transducer and remove the rust, stain, etc. Replace in case of corrosion. • Replace the transducer cable. • Replace the connector of unit. (Ask to repair.)	
	<Faulty of transducer> Please check the followings. If you find abnormal symptom, please replace. 1. If you hear the sound like “Bo Bo” from surface of transducer, it is normal. 2. When you rub the surface of transducer after setting sensitivity and depth to maximum, if dots like rain appears on the screen, it is normal.	
	Transducer is not immersed into water well.	Install the transducer where it is always immersed under the waterline.
	In case of installing the transducer inside the hull, it is not immersed into water because internal liquid becomes less.	Supplement liquid so that transducer can be immersed into water.

Symptoms	Causes	Remedy
Image does not sometimes appear.	Transducer is not immersed into water well.	Install the transducer where it is always immersed under the waterline.
	When installation of transducer is bad, air bubbles wind easily at high speed sailing. It results in no display.	Check the installation of transducer.
	Influence of air bubble when the boat runs across the wakes of another boat.	Move the own boat or wait until air bubbles disappear.
Bottom or fish school is not displayed well.	Too low sensitivity.	Increase the sensitivity. Or set to Auto Gain (automatic sensitivity control).
	<Installation of transducer is bad> • Transducer glued inside the boat's bottom almost come loose. • Transducer installed on boat does not face just under the boat.	Re-install the transducer at adequate position.
	Rubbish, weed or etc. attached on the surface of transducer. In case of installing boat's bottom or liquid is dirty, the transducer inside the hull.	Remove the attachment well. Remove the stain from boat's bottom. Replace the liquid.
	As the reflected echoes are very weak at the below described place, the image low sensitivity may be shown. But it is not trouble.	
	 where there are many sludge.  where there are many sea weeds. where there are many mud of rubbish. where the water is whirled by rapid current.	
Many noise appear on the screen.	Too high sensitivity.	Decrease the sensitivity. Or set to Auto Gain (automatic sensitivity control).
	Interference with other boat's fish finder	Noise disappears if the adequate distance between own boat and other keeps.
	Noise from engine	Change the routing of cables such as transducer cable, power supply cable, or etc. (Separate from engine as far as possible.)

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